

REMARKS

Claims 76-83 are pending in this application.

Claims 76-83 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Miyata et al. (U.S. Patent No. 6,333,258) ("Miyata"). This rejection is respectfully traversed.

The claimed invention relates to an "integrated circuit structure." As such, independent claim 76 recites an "integrated circuit structure" comprising *inter alia* "a first insulating layer comprising SILK material with a dielectric constant of about 2.65 at 100 kHz provided over a semiconductor substrate and contacting at least a portion of a metal layer provided within said semiconductor substrate, said first insulating layer having a thickness of about 4,000 Angstroms to about 30,000 Angstroms." Independent claim 76 also recites "a second insulating layer comprising NANOGLASS material with a dielectric constant of about 3.5 at 100 kHz provided over said first insulating layer, said second insulating layer having a thickness of about 100 Angstroms to about 2,000 Angstroms." Independent claim 76 further recites "at least a first opening within said first insulating layer, said first opening having a first portion with a first width and a second portion with a second width, said first width being different from said second width." Independent claim 76 further recites that the first opening is "being formed by time etching of at least one of said first and second insulating layers with a first etch chemistry."

Miyata discloses a "manufacturing method for forming a dual damascene structure in which the effective permittivity of an inter-layer insulating film is lowered without an etching mask for forming a contact hole, which is otherwise formed in the inter-layer insulating film." (Abstract). Miyata teaches that "[t]he manufacturing

method comprises the step of forming an inorganic film to serve as an etching mask, on the inter-layer insulating film; the step of forming a first opening pattern for forming a wiring groove, in an upper part of the inorganic film; and the step of forming a second opening pattern for forming a contact hole, so as to coincide with the first opening pattern at least partially.” (Abstract).

The subject matter of claims 76-83 would not have been obvious over Miyata. Specifically, the Office Action fails to establish a *prima facie* case of obviousness. Courts have generally recognized that a showing of a *prima facie* case of obviousness necessitates three requirements: (i) some suggestion or motivation, either in the references themselves or in the knowledge of a person of ordinary skill in the art, to modify the reference or combine the reference teachings; (ii) a reasonable expectation of success; and (iii) the prior art references must teach or suggest all claim limitations. See e.g., In re Dembiczak, 175 F.3d 994 (Fed. Cir. 1999); In re Rouffet, 149 F.3d 1350, 1355 (Fed. Cir. 1998); Pro-Mold & Tool Co. v. Great Lakes Plastics, Inc., 75 F.3d 1568, 1573 (Fed. Cir. 1996).

In the present case, Miyata fails to disclose, teach or suggest all limitations of independent claim 76. Miyata is silent about “a first insulating layer comprising SILK material . . . having a thickness of about 4,000 Angstroms to about 30,000 Angstroms” and “a second insulating layer comprising NANOGLASS material . . . having a thickness of about 100 Angstroms to about 2,000 Angstroms,” as independent claim 76 recites. Miyata teaches that inorganic film 13 (which would arguably correspond to the “second insulating layer” of the claimed invention) is a “silicon oxide film” (col. 5, lines 27), and not an insulating layer “comprising NANOGLASS material,” as in the claimed invention. In addition, inorganic film 13 of Miyata has a thickness of 300 nm (which is

3,000 Angstroms) and not of "about 100 Angstroms to about 2,000 Angstroms," as in the claimed invention.

In the April 19, 2005 Office Action, the Examiner admits that "Miyata . . . fails to disclose a NANOGLOSS insulating layer having a thickness of 100-2,000 Å," but asserts nevertheless that "the thickness of an insulating layer is a well known processing variable and the discovery of the optimum or workable range involves only routine skill in the art." (April 19, 2005 Office Action at 3). This assertion, that the thickness of the second NANOGLOSS insulating layer is a result effective parameter, is an unsupported assumption.

Courts have generally recognized the rule that the discovery of an optimum value of a variable in a known process is typically obvious. See e.g., In re Aller, 42 C.C.P.A. 824, 220 F.2d 454, 105 U.S.P.Q. 233 (1955). However, evidence of unobvious or unexpected advantageous properties, such as superiority in a property the claimed compound shares with the prior art can rebut prima facie obviousness. In re Chupp, 816 F.2d 643, 646 (Fed. Cir. 1987). For example, a specific ratio of halogen to mercury for producing whiter light by a lamp was held by the Court to be "critical" for attainment of maximum white light emission, and the claimed ratio was not the result of obvious experimentation. In re Waymouth, 499 F.2d 1273, 1276, 182 U.S.P.Q. 290, 293 (CCPA 1974).

Under the holding of In re Waymouth, the thickness of the "second insulating layer comprising NANOGLOSS material" provided directly over the first insulating layer would not have been obvious as this thickness is "critical." The "second insulating layer comprising NANOGLOSS material" of the claimed invention has a thickness that allows it to be employed during a timed etch process. The specification of the present application specifically emphasizes that "[a]fter the

formation of trenches 65 through the first intermetal insulating layer 55 and the removal of the first photoresist layer 58," "via patterns 63 are then etched by employing a timed etch into the second intermetal insulating layer 57 to form vias 56 (Figure 11)." (Application at 13, lines 6-12). Thus, a person of ordinary skill in the art would not have been motivated to use the inorganic film 13 of Miyata with a thickness of 300 nm (or 3,000 Angstroms) *in lieu* of the "second insulating layer comprising NANOGLOSS material . . . having a thickness of about 100 Angstroms to about 2,000 Angstroms" of the claimed invention, as the thickness of the "second insulating layer" is critical for the time etch process of the claimed invention. For at least the reasons above, the Office Action fails to establish a *prima facie* case of obviousness, and withdrawal of the rejection of claims 76-83 is respectfully requested.

Allowance of the application is solicited.

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Respectfully submitted

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